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ABSTRACT

Brief descriptions of 47 college programs recognized for awards in the National Association of College and University Officers/U. S. Steel Foundation Cost Reduction Incentive Awards Program are given. They include awards for: shower stall repair; chemical waste exchange; vibrating alarms for hearing-impaired; self-funding insurance consortium; livestock bedding as fuel; in-house cable TV installation; movable library storage; antivandalism partnership; retrofit of absorption chiller; selling university equipment; heat and water recovery; decreasing postage costs; silver recovery; earned time for employee absences; centralized irrigation control; low-pressure operation of heating plant; single identification card system; video tapes for student orientation; office automation; centralized gas water heating; reducing vehicle travel costs; landscaping; conserving wasted water; modifications to absorption chiller; waste water use in cooling towers and irrigation; electric lighting used for heat; telephone interviews; daily cash deposits; electrical machines replacing steam units; flashing light telephone signals; bulletin mailings; automatic flush tanks modification; blower shaft repairs; wood chip burning; clock/classroom bell improvement; computer-controlled inventory; residence hall heating control; replacing glass with Lexan; sheathing an old building; in-house book repair; multi-use movable wall dividers; using excess solar-heated water for a pool; reducing boiler pressure and temperature; recovering waste heat; and a new-style dishwashing machine. A list of 1980 winners is appended. (MSE)

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Cost Reduction Incentive Awards

1981 Winners

NACUBO/USSF 1981 Winners

In its sixth year, the NACUBO/U.S. Steel Foundation Cost Reduction Incentive Awards Program has presented to 47 institutions monetary awards ranging from $10,000 to $100 and awards of honorable mention. These awards are made in recognition of outstanding cost reduction programs implemented during the calendar year 1980. Additional information on award-winning programs may be obtained from NACUBO, Attn: Darryl Brown, One Dupont Circle, Suite 510, Washington, D.C. 20036.

Shower Stall Repair
Gonzaga University

Six two- and three-story residence halls at Gonzaga University have gang showers located on the upper floors. These are of traditional ceramic tile construction and normal wear and tear had caused cracks in the grouting, which resulted in leakage and water damage to the flooring and rendered the rooms beneath the showers uninhabitable.

Annual repairs to replace and reseal the tiles were expensive and the supervisor in charge of maintenance decided to try a fiberglass lining. However, fiberglass fabricators could not devise a suitable method for accomplishing this. Eventually, a swimming pool company, which had been successful in repairing vinyl-lined pools, undertook the project and arrived at a method for applying a lining that required only two days' work per facility and cost $1,000 per shower.

The procedure consisted of etching the ceramic floors with a mild acid solution, then placing fiberglass matting on the floors and three feet up the sides of the showers. The matting is covered with resin and feathered, creating a seamless, impervious surface, and then stippled to prevent slipping.

The university saved over $31,000 in one year, which included the resumption of rent from the lower rooms.

Chemical Waste Exchange
Southern Illinois University at Carbondale

The Pollution Control Department at Southern Illinois University at Carbondale faced rising costs and increasing regulations in the collection and disposal of chemical wastes. Administrators decided to try a European plan of chemical waste exchange.

Department officers conferred with other chemical users on campus and found that many needs could be met with an exchange. For example, chemicals still in their original containers and relatively pure are inventoried as exchangeable; among these are herbicides that the Plant and Soil Science Department did not use but could be sent to the Physical Plant Department for use on university grounds. Chemical wastes, reaction products, and contaminated chemicals are evaluated for potential reuse. Some wastes are used to neutralize others by mixing certain acids and bases to form harmless byproducts. Other wastes are treated to restore their purity by the use of simple chemical or physical processes such as distillation, filtration, evaporation, and chemical precipitation. Student workers perform these tasks, thereby receiving training in the field of hazardous waste management.

A list of available or treated chemicals is sent to all interested parties; some departments have standing orders. No claim is made for purity, but low-grade chemicals are considered acceptable for classroom demonstrations, since many researchers repurify their own chemicals in any case. No charge is made for the chemicals and users must arrange pick-up and transportation with availability on a first-come, first-served basis.

Through this program, the university has eliminated disposal costs, reduced replacement costs, and removed a waste product from the environment. Annual savings vary with volume, but nearly $6,000 was realized in one year.

Vibrating Alarm For Hearing-Impaired
Winthrop College

Fire protection for persons with impaired hearing often may not receive adequate attention at institutions because conventional sys-

tems of flashing lights or fans tied into the existing alarm system are expensive and difficult to locate. Winthrop College solved the problem with its adaptation of a vibrating alarm.

The college has a typical alarm system of pull boxes that send signals to a central console in the physical plant office and activate horns in campus buildings. In addition, the college purchased an interconnect paging terminal, base radio receiver-transmitter, and vibrating page units. The vibrating page units and charges are issued on a semester basis to students, faculty, and staff with impaired hearing, who are instructed in the use and care of the units. The paging terminal and other equipment is connected to the existing alarm system. Thus, when the central console receives a signal from a pull box, it also activates the interconnect paging terminal; this signals the base radio receiver, which, in turn, sends signals to the vibrating page units.

The initial investment was somewhat costly because the college did not have radio equipment, but it was 21 times less than initial costs for flashing lights. Maintenance and inventory expense are also far less than for the lights and the system life of twenty years is comparable. Savings amounted to $144,000 a year. The greatest value, however, lies in the increased safety factor for those with impaired hearing. Since airwaves are used in the alarm system, there is no danger of wire failure or disability by fire and the equipment is always with the user, who thus is not dependent on seeing flashing lights or fans to receive a warning.

Self-Funding Insurance Consortium
Florida Community College Risk Management Consortium

Though Florida community colleges operate under common state regulations, they have much autonomy in institutional management. Insurance had been in this autonomous area. However, the two largest community colleges had developed certain successful self-insurance programs, such as one for worker's compensation, and wanted to expand to other areas with more colleges participating.

After an initial study, the risk management consortium began operation in mid-1980 and realized savings approaching $1.3 million in the first year. The consortium provides consultant services and assistance for inspections and data analysis; risk protection for trustees, officers, and employees; protection on worker's compensation; purchasing services to obtain insurance on property; and claims services contracts awarded by competitive selection. It has developed a loss-prevention program and safety manual and is investigating other possibilities for insurance coverage. Safety bulletins on experiences of consortium members are also published.

Livestock Bedding As Fuel
Iowa State University

Iowa State University's College of Veterinary Medicine used sawdust and woodchips from woodworking plants as bedding material for its livestock. Disposal of the used material presented a problem. The city of Ames no longer wanted it hauled to a landfill because it contaminated aquifers. Further, the high moisture content of the material plugged the pneumatic conveyer of the solid waste recovery plant. Spreading the bedding on university farm land was unsatisfactory because of the long decomposition time and composting brought undesirable odors and insects. Finally, administrators decided to mix the material with coal and use it as a fuel in the university heating plant.

The university purchased a silo to store the bedding material. A mechanical unloader transfers the material from the silo to a conveyer that dumps it onto another conveyer filled with coal going to the boilers. The university saved $76,000 last year from burning less coal and avoiding disposal costs.

In-House Cable TV Installation
Mount Saint Mary's College

Mount Saint Mary's College personnel wanted a master antenna cable television system because the alternative required by the mountain setting of the college consisted of a number of external antennas, which detracted

from the beauty of the campus. However, the cost of cable television seemed prohibitive.

The college had included wiring for cable television in the contract for new residence halls nearing completion and had purchased a head end unit, antennas, and other items to receive signals and feed them to the new halls. When the student government association learned of the system, members offered $10,000 from their budget to allow installation in all halls. However, contractors wanted much more money than the college could afford. Then a technician in the multimedia center with a background in cable television agreed to supervise installation if all equipment and drawings were purchased. Using students to install the equipment, the college completed the system for $20,000 — adding $10,000 to match the students' contribution — or about $104,000 less than commercial contractors required.

The modern system has drop boxes that allow transmissions from any location so equipped, which reduces the amount of equipment that must be transported to broadcast or tape from various parts of the campus. The system can also carry closed-circuit television and reduce the cost of a passive security system.

Movable Library Storage Units
Purdue University

Purdue University constructed a new library addition that used movable, compact storage units to effect savings on construction, heating, cooling, and maintenance costs. Savings for a year were $117,000.

Instead of conventional fixed shelving in the closed book stacks, powered, movable compact storage units were used. Electric motors move the storage units and lighting is tied to the moving switch so that only lamps on the one main aisle and access bay need be lighted. The units are not limited to books but can also store items such as entomology collections, art objects, and maps.

This construction allowed the storage of more than one million volumes in a space 60,000 square feet smaller than a building required for conventional shelving. The only limitation is the structural capability of the building floor, which has a load limitation of 250 pounds per square foot.

Antivandalism Partnership
State University of New York at Albany

Administrators at the SUNY-Albany campus were concerned with increasing vandalism and a general deterioration of the quality of life in residence halls. They mobilized faculty, staff, and students into a partnership to take remedial action.

A committee of senior managers was given charge of policies and programs and assessment teams of faculty, staff, and students made periodic evaluations of the halls. Some actions resulting from evaluation were: an allocation of $50 to improve each suite each semester, provided that damage had decreased; allocations of $500 for common quadrangle areas, with a 30% reduction in vandalism as the measure for continued receipt of funds; grants to students and staff on a competitive basis for proposals to improve quality of life; restoration of a different quadrangle each year; assignment of maintenance and grounds personnel to a specific quadrangle to provide personal attention and rapid response to minor problems; simplified paperwork on the reporting of problems; and reaffirmation of the role of the student judicial/disciplinary process to identify and bill perpetrators of damage.

A survey showed that 60% of the students were aware of the incentive programs and that 25% had participated in projects. The university saved $68,000.

Energy Management System
University of California at Berkeley

A computer-based emission measurement and combustion control system installed at the University of California at Berkeley increased its heating plant efficiency by 3.67%.

The system measures the carbon monoxide level in the duct leading to a stack using state-of-the-art photospectroscopy. This measurement is the basis for a calculation of combustion efficiency, with the control system automatically

reducing the air-to-fuel ratio to maintain maximum efficiency. The computer also monitors the real-time efficiency of each boiler every 20 seconds and allocates steam demand to the most cost-effective boiler. The control loop incorporates feed-forward and variable gain functions to keep steam pressure more constant. Also, since fan speed on the draft fans is a function of air-to-fuel requirements, better control of that mix cuts down on the use of the steam-turbine-driven fans, which are the largest energy consumers in the plant.

The system allows an operator to communicate directly with the process without a computer vocabulary and printed reports can be provided. The university saves $200,000 per year, with a payback time of three years.

Retrofit Of Absorption Chiller
University of Colorado at Boulder

A few years after the University of Colorado at Boulder had installed a 1,440-ton absorption chiller, it learned that the manufacturer had introduced a new model that was 10% to 25% more efficient.

The university decided to modify or retrofit its model rather than pay more to install a new unit. Administrators approached the service agency with this idea, and eventually the agency presented a proposal for the modifications and an additional innovation, a "Chillitrol-Mini Computer" system to control the temperature of the chilled-water supply from the unit. The improvements exceeded those of the newer model, with a reasonable payback time.

The university obtained funds from the state for use of the project as a demonstration of energy conservation and the concept has now been applied at several other institutions in the Rocky Mountain region. The university saved $53,000 in a year with the increased efficiency of its unit.

Specific Solar Heating System
Drexel University

As part of its effort to conserve energy, Drexel University raised the temperature of the chilled water in its educational activities building. This permitted deactivation of the building's reheat system. However, the higher relative humidity caused equipment failure, drapery disintegration, and other problems in the instructional television studios.

As a corrective measure, the university tried a hot-water reheat system that supplied only the television studios. But use of that system meant losing all the energy savings. So a solar heat system designed specifically for the television studios was developed by a senior mechanical engineering student who, after graduation, formed his own company and completed the successful bid to carry out the project.

The university saved $3,100 in a year.

Selling University Equipment
Duke University

Duke University has a recycling and sales division responsible for disposing of all excess equipment. The division made two innovations and realized savings of $110,000 per year.

The first innovation involved "detailing," a concept borrowed from the used-car trade. The principle of "detailing" is that the sales price of equipment can be increased significantly by careful cleaning and correction of appearance and mechanical deficiencies. The university applies the principle not only to used staff cars, but also to furniture that previously would have been sold at "give-away" prices. An in-house repair shop was established to clean items and replace damaged parts. For example, about $150 worth of repairs to a mahogany table and chairs increased their sales price to more than $600.

The university's second action was to rent a full-time sales booth at the state flea market in the capital city; this has not only resulted in income, but has also drawn the attention of qualified buyers to some more specialized offerings, such as scientific equipment.

Heat And Water Recovery
Georgetown University

Georgetown University devised a system that extracted heat from water-cooled material-handling systems, boiler feed pumps, and

compressors, and transferred it to the condensate make-up stream. The system increases boiler efficiency by reusing waste heat and reduces the flow of cooling water into the sewer by approximately 20 million gallons each year. A unique feature is the ability to transfer varying amounts of heat to a variable condensate make-up flow. The heat exchanger can be expanded to accommodate future equipment.

The system consists of a heat-recovery station and a cooling-water distribution network. The recovery station has a storage tank, circulator pump, heat exchanger, and tempering valve. The heat exchanger separates the continuously flowing network cooling water from the condensate make-up water, which is variable in temperature and flow. Heat is transferred as long as the condensate make-up water temperature is lower than that of the network water. If the condensate make-up flow is low or interrupted, a tempering valve opens and allows cool city water into the cooling water system to lower the temperature. Additional heat-exchanger plates can be added as new equipment is acquired. The $35,000 savings paid for the system in less than one year.

Decreasing Postage Costs
Hobart and William Smith Colleges

Finding itself with a rapidly escalating postage budget, the administration of Hobart and William Smith Colleges instituted controls on first-class postage and undertook a user education program on how better to use the postal system.

A two-part memo was sent to department heads. The first part explained the problem of increasing costs and inefficient use of the system, indicated options to avoid first-class postage, and listed persons to consult for help. The second part described parameters for sending items first class without special permission from the business office. Guidelines included using third-class postage for all mailings of 200 or more identical pieces, securing the proper indicia from the college postmaster before any printing takes place, and allowing the campus post office ample time for processing mass mailings by zip code.

The colleges also urged consultation with the resident publications officer, who is familiar with postal requirements and the most cost-efficient designs and productions. The campus postmaster has final approval of the processing of all mail and can withhold a mass mailing if it does not have business office approval. Written approval serves as verification and a means of recordkeeping and is valuable in planning future budgets. The colleges saved $60,000 with this system.

Silver Recovery Program
Michigan State University

Michigan State University instituted a centralized program for recovering silver from scrap photographic material. Organized through the university's general stores, the program realized more than $38,000 last year with some of the income, less operating costs, redistributed to user departments based on the volume of photographic supplies they buy.

General stores uses their regular distribution service to pick up full containers of fixer solution and return empty ones. Buckets, tanks, and drums for collection were the only equipment investment other than the silver-recovery machine and extraction canister. A stores employee works a maximum of two hours a day on the recovery unit operation. Fixer solution passed through the silver extractor gives silver chip, which is sent to a precious-metal smelting company that has contracted to process the silver and hold it in escrow until such time as the university wants to sell it. The filter also accumulates a silver deposit, which the university returns to the vendor for credit when silver prices are high. Remaining solution is sold through the university's salvage yard. Accumulated film, from which silver can also be recovered, is sold by competitive bid through the purchasing department.

"Earned Time" For Employee Absences
Plymouth State College

Plymouth State College introduced the concept of "earned time," which restructured paid absences from work from a variety of

categories to a single multipurpose category with cash payment available at the time of termination or retirement. Individual employee priorities determine the use or accumulation of "earned time."

Instead of designated vacation days, sick leave days, or other specific leave, employees earn a certain amount of time each month, depending on their length of service, and are required to use a minimum amount each year to insure some time off work. Employees may pool some days to cover long illnesses or leave for disabilities. The pool is maintained on a basis similar to insurance, with a return of three days for each one pooled; pooled days become unavailable for any other use.

The college pays less than it did under its previous, conventional benefit plan and employees have become more conscientious in the use of their time; they have indicated appreciation of the greater flexibility and control they now have. Savings for the institution are $25,000 per year.

Centralized Irrigation Control
Texas A&M University

When Texas A&M underwent massive growth in the 1970s, grounds around new facilities were equipped with automatic irrigation systems. The systems were individually controlled and constituted a water and labor management problem, since 24 work-hours were required for start-up and shut-down.

The university instituted a centralized system using a tone-coded radio signal received by a remote receiving switch. This type of switch had been used to control utility loads on hot water heaters. The system consists of master control clocks, a central control programmable matrix, and a radio transmitter. When one of the master clocks is scheduled to begin sprinkler operation, it signals the control matrix, which indicates to the radio transmitter the proper tone code to send over a narrow FM band. The receiver switch on the field controller activates the sprinkler after receiving a second signal (to avoid accidental activation by unrelated signals).

Other features of the system include a thermostat to prevent ice formation in a sudden temperature drop, a rainstat for shutdown after a certain amount of rainfall, emergency cut-off so that maximum water pressure can be used for fire fighting, and a lighted display map to aid in planning irrigation schedules. Savings were almost $20,000 for the year.

Low-Pressure Operation Of Heating Plant
Concordia College

When Concordia College decided to try operating the central heating plant at a lower pressure for the summer, it made a thorough evaluation of possible effects of this step. The evaluation showed that a few operations of the food service department and the chemistry and biology departments demanded steam pressure of 45 psi (down from 90 psi used in the winter for general heating) and that most institutional needs could be handled with 14 psi.

A split system was devised, with 45 psi as the weekday, daytime pressure and 14 psi as the night and weekend pressure. Additional pressure controls were added to the smaller summer boilers, and low water shutoff safety controls were added for night and weekend operation. Institutional personnel performed some of the retrofit, and the payback period was less than a month.

Savings totaled almost $39,000 with fuel consumption reduced to nearly half the amount for the previous six summers.

Single Identification Card System
Cornell University

At Cornell University, representatives of business offices, libraries, photographic services, campus stores, dining halls, and computer services formed a committee to devise plans for a single identification card system, which first involved students and then employees.

The resulting "Unicard" combined the university's dining, credit, and health services cards into one student identification. The total

number of cards issued dropped from more than 26,000 to about 7,000. An initial investment in modern card-production equipment was required, but this was in lieu of replacement equipment to maintain the former card systems. The single identification card now has 19 uses, including athletic facilities, libraries, dining areas, and buses. Savings are $6,000.

Video Tapes For Student Orientation
University of the District of Columbia

The University of the District of Columbia found orientation of new students complicated by its diverse offerings, scattered sites, and nontraditional student population (higher ages, high percentage of employed, and need for instructional or tutorial support). Orientation had to be comprehensive but offered at various times and places for limited numbers of students who could require individual assistance.

To answer the need, two color-and-sound video tape productions were prepared, with complementary literature, to be presented by an academic adviser. One tape introduces the university and visits its various sites and programs. The second tape describes personnel and support services, with visual reference to the printed material, and offers information on registration. The tapes are modular in design, with pauses for the adviser to take questions, and a single module can be changed if any policy or person presented in it is changed. The savings of $43,000 were from in-house production and from reduced work-hours required for orientation.

Office Automation Project
College of Du Page

The College of Du Page instituted an office automation project, using advanced administration concepts and word processing equipment to reshape the way office work is accomplished by the provost and various deans.

Eight offices are now served by a management support team of four people, rather than by individual office secretaries. Each administrator has a video work station and access to the support team. The administrators receive training on information entry and retrieval, dictation, etc.; on text and data processing; and on electronic mail and calendaring. Staff not selected to participate in the project were relocated to comparable positions in the college.

The major benefit of the program is in efficiency and productivity (increased about 80%), with savings amounting to $36,000.

Centralized Gas Water Heater
Harford Community College

A system that heated water for an indoor pool, showers, and dining areas in two adjacent facilities at Harford Community College was built in the 1960s when operating costs were not prohibitive. The system used two oil-fired boilers designed primarily for building heating.

Harford studied the demand in the areas mentioned above and the operation of other facilities and decided on a centralized gas hot water boiler. Existing pumps were replaced by two 3/4 hp pumps and existing piping was used so that installation costs were low. The gas boiler possesses sufficient reserve capacity for heavy shower or dishwashing demands. The new system operates during the nonheating season, so the oil-fired boilers may be shut down; it can also satisfy temporary heating demands during early spring and late fall. Savings were almost $10,000 for the year.

Reducing Vehicle Travel Costs
Mankato State University

Mankato State University developed automated systems to determine vehicle mileage reporting and vehicle costs and established a vehicle coordinator to handle requests for all university and private auto use. The university also required faculty and staff to use public transportation whenever possible and required those teaching off campus to use car pools.

The system allocates a certain mileage to each department. Detailed reports of each state and private vehicle trip are entered in the system and departments are notified of miles allocated and miles used. The business office and vehicle office also have reports summarizing university vehicles used on an individual or fleet basis,

including charge rate, miles driven, mpg, repair costs, etc. This information aids in decisions on vehicle replacement. Trip mileage information aids department heads in controlling unauthorized use. The vehicle coordinator organizes all business trips and can set up car pools. Private vehicle miles were reduced about 190,000 for the year and savings were $56,000.

Alternate Plan For Landscaping
University of North Carolina at Charlotte

When the University of North Carolina at Charlotte built a new student housing complex on a wooded hillside, some trees were removed or damaged and erosion became extensive. Rather than use a conventional method of landscaping, which would have been expensive to install and maintain, the university allowed the hillside to return to its natural state by repairing erosion, spreading wood chips and bark, and planting 300 tree seedlings. This ground cover is expected to encourage the growth of underbrush and trees, eliminate further erosion, and require minimal maintenance. The savings were $5,000 outright over the use of conventional landscaping and about $3,800 a year in maintenance.

Conserving Wasted Water
Radford University

Radford University found that its swimming pool was losing more than 10,000 gallons of water per day through drains in the scum gutters; these were connected to the main sewer line so that all overflow was wasted. This was valuable water already heated and chemically treated.

Radford personnel installed tanks and connected the drains from the scum gutters to the tanks. A system was set up to circulate the overflow water back into the pool system. A float switch in the tanks operates at a predetermined level, activating in turn a solenoid valve and the pneumatic valves, allowing the pump to pull water from the tanks and recirculate it. When water in the tanks returns to the desired level, the pump resumes normal operation. Should the valves or control system malfunction, a flow switch cuts off the pump. The cost was $3,000; the savings are $11,000 a year.

Modifications To Absorption Chiller
Rochester Institute of Technology

The efficiency of the Rochester Institute of Technology's absorption chillers was improved by several modifications. These included adding a part-load economizer, which is a valve and diaphragm unit installed in the solution line to modulate the flow of solution from the absorber in direct proportion to the load. Another modification was increased sump capacity, which allows the refrigeration process to be accomplished at lower loads, using cooler condenser water.

A logic center microprocessor system was also added to save energy by matching fuel consumption to actual building load, controlling temperature and water schedules, and other means. The system also reduces maintenance by eliminating absorber crystallization and monitoring safety controls and activating the dilution cycle if a malfunction occurs. The savings are $11,000 annually with a payback time of 4 years.

Use Of Waste Water In Cooling Towers And Irrigation
St. Petersburg Junior College

The city of St. Petersburg had received a federal grant to recycle and purify sewage water and to distribute it for nonpotable purposes. Since air conditioning and lawn irrigation are necessary in that part of Florida for 8 months every year, St. Petersburg Junior College was using thousands of gallons of potable city water for those purposes.

When the waste water became available, the college began using it in its air conditioning cooling towers. Sulfuric acid had been used previously to increase the cycles of concentration and save on the cost of water by reducing the amount of bleed-off. But it posed a danger to workers, and the use of the cheaper waste water no longer mandated use of sulfuric acid.

In the irrigation systems, the city furnishes the waste water at a constant line pressure that eliminates the need for irrigation pumps. Installation of the college hookup to the city's waste water system was $5,000; savings for the year were $15,000.

Electric Lighting Used For Heat
University of South Dakota at Springfield

When fuel oil prices rose, the University of South Dakota at Springfield was threatened with a projected budget deficit for utilities. Time did not allow a quick change-over to electric generators or heat pumps. However, since electrical energy was much cheaper, it was decided to use the electric lighting systems in buildings as a heat source.

The university's electric lights were turned on 24 hours a day, 7 days a week during a portion of the heating season when continuous heating was required in buildings. The technique required no investment or training, but a publicity program was undertaken to inform staff, students, faculty, and the general public that the plan had been carefully analyzed and that energy was not being wasted through continuous lighting. Savings were $7,000.

Telephone Interviews
University of Washington

A national search for administrators is expensive, especially when a number of out-of-state candidates must be brought in for an interview. The University of Washington, therefore, used conference telephone calls to allow search committees to conduct preliminary interviews.

A telephone interview provides additional information about candidates that may not appear on a resume or questionnaire and allows for better ranking. Thus, the field of applicants can be narrowed to a few finalists without rejecting any qualified applicant. Finalists are still interviewed in person. The University of Washington saved over $2,000 using this method last year.

Daily Cash Deposits
Alma College

Cash gifts to the development office of Alma College had been retained and turned over to the finance office for deposit every week or ten days. Now the college has arranged for daily deposits so that the money can begin earning interest immediately. This gains over $400 a year in simple passbook interest and more when placed in a daily income trust.

Electrical Machines Replace Steam Units
Boston University School of Medicine

The research and instructional buildings at Boston University School of Medicine used steam absorption units to produce chilled water for air conditioning. Since the cost of a BTU of steam is three times higher than the cost of a BTU of electricity, the institution replaced its equipment with electrical centrifugal machines containing inverters that modulate the compressor motor speed to match the load as it varies with weather conditions. Savings reached $115,000 per year.

Flashing Light Telephone Signal
University of Cincinnati

The University of Cincinnati's physical plant shops are all on one floor, separated only by wire mesh. Many telephone calls were missed because of noise levels or confusion over which phone was ringing. Rather than pay commercial rates for flashing lights for shop telephones, university personnel attached a magnetic pickup coil to the outside of individual phone cases. This picks up a ring on the telephone and activates an optic coupler that starts a lamp flashing that is visible to the entire shop. Cost of installation was minimal and savings were $900 for the year.

Bulletin Mailings
Duke University

Previously, Duke University mailed all of its almost 200,000 bulletins in second-class envelopes. The printing of required postal regulation information on the second page of the bulletin eliminated the need for envelopes. Bulletins are now labeled and processed at a faster rate in the bulk mail room. Savings were more than $8,000 in a year.

Automatic Flush Tanks Modification
Eastern Illinois University

Eastern Illinois University had a series of urinals that flushed automatically whether used or not. To avoid this waste of water, physical plant staff installed electric control valves activated by a door switch timer. Thus, water flow is induced only when the door is opened after use. Repeated openings during filling do not affect the flow. The university saved $95,000 last year with this modification.

Blower Shaft Repairs
Louisiana State University

For years Louisiana State University had routinely replaced whole blower shafts, even though only 5% of the surface was damaged, because of inability to repair the damaged portion. But a new development in metal spraying made repair simple and economical. The device used existing oxygen-acetylene equipment to spray a premixed and metered powder onto the shaft and required a small lathe to reshape the shaft. Savings were $600 per year.

Wood Chip Burning
Middlebury College

Middlebury College decided to use an old coal-burning boiler, which had been on stand-by, for burning wood chips that are purchased from a local lumber mill. Some adjustments were made to move the bridge wall inside the boiler wall and increase its height. A hole was cut to blow in the chips, and storing, moving, and feeding systems were developed. The system provides all the hot water and steam needed in the spring, summer, and fall and supplements the coal and oil burners in the winter. Savings were $77,000 last year from burning wood chips instead of fuel oil.

Clock/Classroom Bell Improvement
University of Missouri-Columbia

To avoid cost penalties on electricity used by their high voltage clock/classroom bell system, the University of Missouri-Columbia installed power factor capacitors. However, these changed the impedance load and short-circuited the signal generator. Although the manufacturer indicated that the entire system needed replacement, university personnel were able to install inductors to adjust the impedance to the manufacturer's specifications. These inductors provided stable line impedance while the capacitors made power factor correction. The cost was $61,000 less than that of a new system.

Computer-Controlled Inventory
University of North Carolina at Charlotte

The University of North Carolina at Charlotte replaced its manual inventory control/accounts receivable system with a micro-computer. The programs are written in disk basic language which is easily learned and allows programs to be customized for individual accounting systems. Inventory control and accountability were improved and work-hours reduced by the installation. The time saved allowed an $11,000 position to be vacated through attrition.

Residence Hall Heating Control
Northeast Missouri State University

Residence halls at Northeast Missouri State University have hot water heating systems with outside air sensors to control water temperature. They are also zoned to reduce water circulation when thermostats are satisfied. However, during breaks in the academic year, zone controls often

drop circulation too much and freeze-ups can occur; further, the zones are suitable for the coldest part of winter, but not for spring and fall. The university installed a pneumatic switch that can let the system operate as before, or be put on manual operation, which blocks the master control and lets the signal come from a variable pneumatic regulator. Energy is saved by not allowing water temperature to fluctuate with outside temperatures, and during break periods a lower water temperature can be held and circulation not interrupted. Savings were $5,000 for the year.

Replacing Glass With Lexan
Polytechnic Institute of New York

A classroom and laboratory facility at the Polytechnic Institute of New York is close to a high school and about half of the glass window panes had to be replaced each year because of stone throwing. The stones also destroyed equipment and caused heat loss and water damage. The institute replaced the glass panes with a polycarbonate called Lexan, which is unbreakable. Though more expensive than glass, Lexan can save $8,000 each year by avoiding glass replacement.

Sheathing An Old Building
Robert Morris College

A Robert Morris College classroom building in the center of Pittsburgh was fifty years old. The college added to the building and renovated it by replacing old windows with tinted thermo glass and by sheathing the existing, uninsulated walls with brick to create a dead air envelope. Appearance and efficiency were improved, major new construction was avoided, and classes continued uninterrupted. Energy savings from increased efficiency were $46,000.

In-House Book Repair
Suffolk University

The law school library staff at Suffolk University accomplished preventive work as well as major repair work on law books without sending them out to a commercial firm. Using a liquid plastic adhesive, cheesecloth as the connector, and wax paper as the protector of other parts of the book, the staff saved $6,000 over commercial prices, were able to keep more books on the shelves for use, and devoted more time to students' needs rather than to recordkeeping on books out for repair. The work was performed in the summer when law classes were not in session.

Multi-Use Movable Wall Dividers
Texas A&M University

In building new apartments, Texas A&M University arrived at a "great room" concept that allows the tenant to determine interior arrangement. Wall dividers are six movable wardrobes, two providing closet space and storage shelves, two with closet space and deep shelving, and two with built-in desks. Apartments can easily be adapted to accommodate four single students or a married couple. The apartments are sited to use prevailing winds for air flow, and the movable interior walls allow for greater flow and save on air conditioning. Savings are estimated at $53,000 per year.

Using Excess Solar-Heated Water For Pool
Umpqua Community College

Umpqua Community College in Oregon has a solar hot water system on its fine arts building for supplementary heating. From April through October, hot water is in excess of building needs. Since piping already existed from the fine arts building to the physical education building, an additional line was run to the outdoor pool, which was heated by this means from the solar panel source until late October. The first four months of operation paid for the cost of installation. Savings were more than $5,000 per year over the previous method of heating, which used gas-fired boilers.

Reducing Boiler Pressure And Temperature
U.S. Air Force Academy

The heating plant at the U.S. Air Force Academy was designed to operate at 425 psi and 454°F. The heating plant foreman reduced the pressure to 240 psi and the temperature to 400°F. and realized a 4.5% reduction in BTUs consumed or dollar savings of $108,000 for the year. Most hot water systems that have an overcapacity designed into them could adapt this technique with some experimentation for individual plant size.

Recovering Waste Heat
Wesleyan University

Heat was wasted into the atmosphere between the compressor and the cooling tower serving the ice-making equipment in Wesleyan University's hockey rink. To correct this situation, copper tubing was coiled around the compressor discharge line and city water was rerouted into the coils. This picked up the waste heat and stored it in a new 750-gallon tank for use in the building's showers. The water is recirculated to continually pick up additional heat and stored water is fed, on demand, into the building furnace heating coil for use in the building. Savings were $1,800 for the year.

New-Style Dishwashing Machine
University of West Florida

The University of West Florida replaced an old "flight-line" dishwasher with a new low-temperature, chemical rinse machine that is smaller with fewer moving parts. It uses 120°F. water exclusively and does not require a heat booster for rinse water since it uses a sanitizing rinse agent. The rinse water is not drained but used for the next wash cycle. All detergents and rinses are dispersed automatically and food debris is trapped when wash water is drained. No venting is required. The lower temperature leaves the ambient air cooler and less air conditioning is required in adjoining areas. The new machine requires less power to operate and less power to heat water. Savings were over $5,000 per year.

1980 Winners

Waste Automotive Oil as an Alternative Fuel
Skidmore College
Optimum Utilization of Space
University of Dubuque
Personnel Upgrading
Louisiana State University
Energy-Efficient Outdoor Lighting
California State Polytechnic University — Pomona
Total Library System
Claremont University Center
Integrated Laboratory Operation
Golden West College
Reduced Electrical Energy Consumption
Lafayette College
Vocational Training in Food Preparation
Waukesha County Technical Institute
Energy Consumption Monitoring System
The Art Institute of Chicago
Energy-Efficient Laboratory Ventilation
University of Cincinnati
Temperature Monitoring
Chatham College
Reverse Osmosis for Distilled Water
George Washington University
Cost-Effective Vehicle Maintenance
Duke University
Cable Communications
Michigan State University
Heating from Steam Manholes
Mount Holyoke College
Catalog Redesign
Northern Kentucky University
Energy Reduction and Climate Control
Oregon State University
Temperature Control
Allegheny College
Prepaid Air Travel
University of Arkansas
Energy Conservation
Brevard Community College
Community Health Center
Colorado Women's College
Pipeline Construction
Creighton University
Dictation Equipment
University of Detroit
Telenetwork System
Kirkwood Community College
Shared Athletic Center
Loras College
Bulk Purchase of Fuel
New England College
Direct Claims Service
University of New Mexico
Paper Conservation
University of North Carolina at Chapel Hill
Automated Banking
North Carolina State University at Raleigh
Time-Temperature Telephone Service
University of Rochester
Insulated Shades
St. Francis College
Controlled Use of Air Conditioning
State University of New York at Plattsburgh
In-House Painting
University of Virginia
Assessment of Telephone Traffic Load
University of Washington
Grounds Maintenance
University of Arizona, Tucson
Manual Boiler Control
Benedict College
Solar Heating
Bentley College
Mail Delivery
Eastern Kentucky University
Garbage Removal
Eastern Mennonite College, Inc.
Ski Lodge Construction
Franklin Pierce College
Maintenance System
Hobart and William Smith Colleges
Computerized Payroll
Indiana University-Purdue University at Fort Wayne
Maintaining Outdoor Garbage Containers
Louisiana State University
Moisture Meter
Louisiana State University
Gymnasium Heating
Loyola College
Telephone Billing Service
Medgar Evers College
Economizer Coils
University of New Mexico
Personnel Data Input
University of North Carolina at Charlotte
Burning Waste Oil
Northern State College
Ceiling Fans
Roane State Community College

General Contracting
Ottawa University
Energy Conservation in Transportation
Southwest Texas State University
Modular Dormitory
Texas A & M University
Single Input Purchasing Process
Wichita State University

Additional information on the 1976, 1977, 1978, 1979, and 1980 winning programs is available from NACUBO, Attn: Darryl Brown, One Dupont Circle, Suite 510, Washington, D.C. 20036.

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